

INDIAN BEND WASH - SOUTH AREA

**PRELIMINARY PROPERTY INVESTIGATION
FOR
CIRCUIT EXPRESS, INC.**

AR1712

Parcel No. 132-37-140

Prepared for:

**U.S. Environmental Protection Agency
Region IX
75 Hawthorne Street
San Francisco, California 94105**

**Site Inspection Technical Memorandum
Originally Prepared in May 1991 by:**

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**EPA Contract No. 68-W9-0031
EPA Work Assignment No. 31-06-9LG6
CH2M HILL Project No. RDD69103.SLA6**

Amended in April 1993 by:

**SAIC/TSC
20 California Street, Suite #400
San Francisco, California 94111**

**EPA Contract No. 68-W9-0008
EPA Work Assignment No. C09052
SAIC/TSC Project No. 06-0794-03-1208
SAIC/TSC DCN: TZ4-C09052-RN-M17161**

Amended in November 1994 by:

**Arizona Department of Environmental Quality
3033 North Central Avenue
Phoenix, Arizona 85012**

**EPA Contract No. _____
EPA Work Assignment No. _____**

1.0 SOURCES OF INFORMATION

A number of sources have been reviewed to obtain information about the Circuit Express, Inc. (CEX) facility in Tempe, Arizona. These sources include pertinent municipal, county, state, and federal regulatory files; historical aerial photographs; and on-site interviews and inspections.

On May 29, 1990, CH2M Hill, as EPA contractors, conducted interviews of Don Morrow, Patricia Massman, and Beverly Fischgrund of B&P International Land, Title and Investments (B&P), the owner of the property (h:1). On July 11, 1990, CH2M Hill conducted a site inspection of the CEX facility and interview of Tudor Melville, vice-president of CEX (o:1).

On November 8, 1988, EPA Region IX requested that CEX and B&P provide data and information pertaining to the CEX facility, corporate structure, disposal practices, and other related subject matter, as authorized by the statutory provisions of Section 104(e) of CERCLA, as amended by SARA (hh:1; ii:1). The undated response letter from CEX was signed by Errol W. Melville, president of CEX (k:1). The response letters from B&P, signed by Patricia Massman and Beverly Fischgrund, partners of B&P, are dated December 9, 1988, and January 10, 1989 (f:1; g:1). On June 7, 1989, EPA Region IX sent a general notice letter to B&P, as authorized by the statutory provisions of Sections 106(a) and 107(a) of CERCLA, as amended by SARA (m:1).

On August 24, 1992, EPA Region IX requested that CEX provide additional data and information pertaining to the CEX facility, corporate structure, disposal practices, and other related subject matter, as authorized by the statutory provisions of Section 104(e) of CERCLA, as amended by SARA (jj:1). The response letters from CEX, signed by Alfred W. Ricciardi of Robbins & Green, attorneys for CEX, are dated October 20 and 26, 1992 (n:1; kk:1).

Appendix A of this preliminary property investigation (PPI) is the list of references cited in this PPI.

2.0 LOCATION INFORMATION

The CEX facility is located at 2149 E. 5th Street, Tempe, Arizona (o:1). The Maricopa County Tax Assessor's parcel number is 132-37-140. The site occupies about half an acre (o:4). Figures 1 and 2 show the location and facility layout.

3.0 LAND OWNERSHIP

As of October 20, 1992, the property had been jointly owned since December 15, 1982, by B&P International Land, Title and Investments, a partnership (85% interest); Richard J. Lund (7.5% interest); and Donald D. Morrow and Janet M. Morrow (7.5% interest). Canstate Investments, Ltd., an Alberta, Canada corporation, owned the property from October 30, 1979, to December 15, 1982. Eaton International Corporation, a California corporation, owned the property from July 25, 1973, to October 30, 1979. (f:1,3; h:3; n:24,25,10000059-61)

See Appendix B of this PPI for a title tree providing past land ownership information.

4.0 IDENTIFICATION OF PAST ON-SITE OPERATIONS

The property was agricultural land until 1973 (f:2,3). In the early 1980s, the current manufacturing building was constructed on the parcel (f:3; h:3).

Electronic Circuitry Manufacturing

Electronic Circuitry Manufacturing Corporation (ECM) operated a printed circuit board manufacturing plant at this facility from September 30, 1981 until "approximately 1984" (f:3; n:9,25,10000064,1600001). ECM ceased operations and went out of business on March 13, 1984 (n:9; l:1).

Megatronics

Megatronics, Inc. (formerly Equipment Specialties, Inc.) manufactured printed circuit boards at this facility from approximately July 1984 through 1986 (n:5,9,25). See the PPI for Megatronics, Inc. for information on this company and its operations.

Circuit Express

Circuit Express has operated a circuit board manufacturing facility at this site since October 1, 1987 (n:9,25,04000001). As of April 3, 1992, CEX planned to vacate the property and relocate its operations to 229 South Clark Street, Tempe, Arizona, by the "end of the first quarter of 1993" (v:2). As of April 3 and October 20, 1992, CEX had relocated its offices, but not its manufacturing operations, to 229 South Clark Street (v:1; n:10). As of December 7, 1992, CEX planned to complete its relocation by February 1993 (r:1).

Chase Bank of Arizona

When Megatronics filed for bankruptcy, Chase Bank of Arizona, a creditor, acquired the assets of Megatronics at the site during the spring of 1987. Digby Melville, later a shareholder of CEX, subsequently purchased those assets. (n:16000001,02000144; o:2)

5.0 CORPORATE INFORMATION

Electronic Circuitry Manufacturing Corp.

According to B&P, the owners of ECM included Michael Antellocy, Jeffrey Foster and Hank Gardner (f:3). ECM ceased operations and went out of business on March 13, 1984 (l:1). Megatronics purchased some of the assets of ECM (n:9).

Megatronics, Inc.

Megatronics incorporated in Arizona under the name of Equipment Specialties, Inc., on or about May 23, 1980 (n:5). The directors at that time were Errol W. Melville, Charlene A. Melville, Louis A. Pesce, and Floyd R. Cook (n:5-6).

As of October 1981, the officers were Errol Melville (president) and Charlene Melville (secretary). The directors included Errol Melville, Charlene Melville, and Robert Attarian. Errol Melville was the sole shareholder. (n:6)

In July 1984, the corporation changed its name from Equipment Specialties, Inc. to Megatronics, Inc. In 1985 and 1986, the directors were Robert G. Attarian, Errol Bartine, Errol W. Melville, and Thomas Connors. As of 1987, the officers were Robert G. Attarian (chief executive officer), Tudor Melville (president), Roger Kreibehl (vice-president), and Garry D. Kline (secretary and treasurer). The directors included Robert G. Attarian and Steven T. Meadow. Errol Melville and Charlene Melville were the shareholders. (n:6,7,9)

On February 13, 1986, Megatronics filed for bankruptcy, and ceased doing business (n:8,02000144). Digby Melville, later a shareholder of CEX, purchased the assets of Megatronics (n:02000144). The Arizona Corporation Commission revoked the corporate charter of Megatronics, Inc. on December 10, 1987 (n:7).

Circuit Express, Inc.

Circuit Express, Inc. incorporated in Arizona on October 15, 1987. From October 15, 1987, to January 15, 1989, the officers were Errol W. Melville (president and treasurer) and Charlene R. Melville (secretary). The directors were Errol W. Melville and Charlene R. Melville. Digby

Melville and Charlotte Melville, husband and wife, were the shareholders. (n:3,4,2000001; p:1; q:2)

From January 15, 1989, to November 9, 1989, the officers were Errol W. Melville (president) and Digby Melville (secretary and treasurer). The directors were Errol W. Melville and Digby Melville. The shareholders were Digby Melville and Charlotte Melville. (n:4)

From November 9, 1989, to August 20, 1991, the officers were Digby Melville (chairman of the board of directors and president), Tudor Melville (vice-president), and Charlotte Melville (secretary and treasurer). The directors and shareholders were Digby Melville and Charlotte Melville. (n:4; kk:2,3; s:2)

From August 21, 1991, to December 31, 1991, the officers were Digby Melville (chairman of the board and president), Jackson Roberts (executive vice president), Tudor Melville (vice-president), and Charlotte Melville (secretary and treasurer). The directors and shareholders were Digby Melville and Charlotte Melville. (kk:2,3)

From January 1, 1992, to March 31, 1992, the officers were Digby Melville (chairman of the board), Jackson Roberts (president), Tudor Melville (executive vice-president), and Charlotte Melville (secretary and treasurer). The directors and shareholders were Digby Melville and Charlotte Melville. (kk:2,3)

From April 1, 1992, to October 26, 1992, the officers were Digby Melville (chairman of the board), Jackson Roberts (president), Tudor Melville (executive vice-president, who resigned on May 8, 1992) and Charlotte Melville (secretary and treasurer). The directors were Digby Melville, Jackson Roberts, and Charlotte Melville. Digby Melville and Charlotte Melville held 800 shares of stock. Jackson Roberts held 200 shares of stock. (n:5; kk:2,3; r:2).

According to CEX, there is no relationship between ECM and Megatronics or CEX (n:9). However, according to B&P, CEX was essentially a reorganization of Megatronics (h:3). Digby Melville, later a shareholder of CEX, purchased the assets of Megatronics (n:02000144).

B&P International Land, Title and Investments

B&P is a California partnership. The partners are Beverly Fischgrund and Patricia Massman. (f:1,3)

6.0 LAND USE EVALUATION

6.1 INTERPRETATION OF AERIAL PHOTOGRAPHS

Historical aerial photographs of the SIBW study area, taken annually from 1962 to 1989, were reviewed to examine land use changes that have occurred at the Circuit Express site. The following chronology is based on CH2M Hill's interpretation of these photographs:

- 1962 to 1979--The property is part of an active ranching/farming operation until 1979.
- 1980 to 1989--A building is located at the present CEX facility. The building is approximately the same size as the present structure.

6.2 CURRENT AND HISTORICAL PHYSICAL UNITS LOCATED ON-SITE

6.2.1 BUILDINGS

One building is on the site, covering approximately 7,750 square feet of the 22,500 square foot lot, and housing the manufacturing operations (h:3; o:4; w:9). This block and stucco building was constructed in 1980 and 1981 (u:1-2). A smaller shed-type building was constructed at the southwest corner of the lot in 1984 for use by Megatronics (t:2-3,5-6; u:1). This shed was used to store chemicals and hazardous waste (a:4). The shed is a roof supported by posts without exterior walls, is surrounded by a chain-link fence, and has a concrete floor with two-inch curbs to contain and control spills of chemicals (a:4; n:10000052). The dimensions of the shed are approximately 15 feet by 24 feet (a:4).

A closure plan for the CEX facility, dated May 18, 1992, states that the chemical storage area will be dismantled and disposed of before CEX vacates the property (w:1-3).

6.2.2 GROUNDWATER SUPPLY AND MONITORING WELLS

No groundwater production wells are known to exist at this facility (h:6; o:12). The building is connected to the city of Tempe water system and sewer system (aa:1).

A groundwater monitoring well (well no. SIBW-6U) has been installed by EPA Region IX in the rear of the facility near an on-site drywell (w:3,9).

6.2.3 DISPOSAL SYSTEMS (LEACHFIELDS, DRY WELLS, INJECTION WELLS, SEPTIC TANKS)

A three-inch by six-inch dry well on the site, installed before 1983, was used primarily for the disposal of storm water runoff (h:6; o:12; n:19). However, ECM was observed disposing of a copper rinsewater solution into the dry well in February 1984 (l:1; n:18-19; o:12). This disposal was reported to the Arizona Department of Health Services (ADHS) in March 1984 by the City of Tempe (l:1). The Arizona Department of Environmental Quality (ADEQ), successor to ADHS, ordered the dry well capped in 1987 (l:1; o:12). As a result of that order, the dry well was excavated to a depth of five feet, and a 55-gallon plastic drum was buried in the excavated area and sealed in place with cement (w:3).

6.2.4 ABOVE AND BELOW GROUND STORAGE TANKS

Appendix D of this PPI contains a list of 32 above-ground tanks at the facility, and the nature and quantity of each tank's contents (mm:1-4). No underground storage tanks are known to exist at the facility (h:6; o:13; n:10000008,10000033,10000034).

7.0 CURRENT AND HISTORICAL OPERATIONAL INFORMATION

7.1 FACILITY PROCESSES

ECM, Megatronics and CEX all have manufactured printed circuit boards at the facility (n:9). CEX engages in plating, etching, drilling and stripping operations (k:1; n:10). Appendix C of this PPI provides a step-by-step outline of CEX's manufacturing process (n:10-12).

7.2 CHEMICALS USED AND WASTES GENERATED

Chemicals used by ECM included methylene chloride, copper, cyanide, lead, nickel, sulfuric acid, hydrochloric acid, fluoboric acid, hydrogen peroxide and sulfuric reagent (aa:5).

Chemicals used by Megatronics included ammonium hydroxide, hydrochloric acid, nitric acid, soda ash, sodium hydroxide, sulfuric acid, potassium hydroxide, hydrogen peroxide, formaldehyde, "alcol ether DB," and copper sulfate (ll:2-3). Wastes generated by Megatronics included copper and other plating solutions (n:26).

Chemicals used by CEX include cyanide for gold plating; Ultra Etch-20 (containing copper ammonium chloride) for alkaline etching; Micro-Etch (hydrogen peroxide and sulfuric acid) for copper etching; toluene; trichloroethylene (also known as trichloroethene); lead; nickel; tin; sulfuric acid; fluoboric acid; hydrochloric acid; potassium permanganate; and sulfuric peroxide

(k:1,18-19; n:13-15; o:6-8; x:2; cc:3). Appendix D of this PPI contains a list of process tanks and a summary of hazardous materials at the CEX facility, as of September 14, 1992 (o:6; mm:1-5).

According to CEX, CEX has not used perchloroethene (PCE), trichloroethane (1,1,1-TCA), trichloroethene (TCE) or any other volatile organic compound in its manufacturing process (n:15). However, as of December 30, 1991, five gallons of TCE were present at the facility, and were used at the rate of 100 ml per day (x:2). According to CEX, all of the TCE evaporated during use (x:2).

Wastes generated by CEX include nickel-sulfide sludge, tin-nickel rinsewater, spent Micro-Etch (containing copper), spent 75-95 solder strip (containing tin), spent Rack strip (containing tin and copper) and spent alkaline etch (containing copper) (k:1; o:6-9).

The sludge generated by the facility's wastewater treatment system has been designated with EPA hazardous waste code numbers D002, F001 and F006 (n:20,9000020,9000026,9000046).

In its 1988 generator annual hazardous waste report to ADEQ, CEX reported generating the following types and quantities of hazardous waste: 3,020 gallons of waste alkaline copper chloride corrosive material NA1719 (D002); 3,550 gallons of waste corrosive material UN1760 (D002); and 500 gallons of hazardous waste solid ORM-E NA9189 (D002).

7.3 WASTE DISPOSAL METHODS

ECM discharged its wastewater to the city sewer pursuant to an interim industrial waste discharge permit issued by the city of Tempe (aa:1). The permit notes that ECM's wastewater exceeded discharge limits for lead and copper (aa:1). According to the permit, ECM's wastewater also contained methylene chloride, sulfuric acid, hydrochloric acid, fluoboric acid, and sulfuric reagent (aa:5). In addition to the sewer, ECM also disposed of wastewater containing copper and lead to the on-site dry well (l:1,2; o:10; aa:1; bb:1).

Megatronics shipped waste copper sludge and spent plating solutions off-site for disposal or reclamation (h:1; n:26). Megatronics discharged treated wastewater to the city sewer (n:26). On at least one occasion, in 1985, the wastewater exceeded discharge limits for copper (y:1).

CEX operates an in-line recovery system that removes copper from plating wastewater prior to discharge to the city sewer system (k:1; n:19-20). Megatronics operated a similar system (n:26). The system operates according to the following steps (n:19-20):

- The pH is adjusted to a pH of 2.5 in a collection tank.

- Wastewater is then pumped into a reaction tank at 10 gallons per minute (gpm).
- The reaction tank consists of a tank with 8 columns in series that are filled with aluminum turnings through which the water flows. A metal replacement reaction removes the copper.
- The wastewater flows from the reaction tank into the final neutralization tank where the pH is adjusted to 7.0 to 9.0 pH. The wastewater then flows into the city sewer system.
- Sludge from the treatment system is pumped through a filter press and stored in 55-gallon polypropylene drums until shipped off-site for disposal.

CEX manifests its other waste streams off-site for disposal or reclamation. CEX's waste haulers have included Great Western Chemical, Delmar Distributors, Disposal Control Service, Chemical Waste Management, and Suttles Truck Leasing. (k:1,27-52; o:7; n:8000001-8000017,9000001-9000056).

Rags used to clean polypropylene tanks, tables and equipment with toluene were stored in metal containers until the toluene evaporated (k:1; n:13-14).

8.0 REGULATORY HISTORY AND PERMITTING INFORMATION

The CEX facility has been inspected by EPA Region IX, ADEQ, and the City of Tempe (n:10000018). Table 1 (following page) contains a history of regulatory actions and selected correspondence.

Table 1
Regulatory Correspondence, Inspections, and Meetings
Circuit Express Facility

| | |
|--------------------|---|
| March 16, 1984 | Letter from City of Tempe Wastewater Department to ADHS reporting illegal disposal of copper solution down dry well (l:1). |
| October 20, 1987 | ADEQ conducts inspection of facility (a:1). |
| October 27, 1987 | Letter from ADEQ to Circuit Express providing inspection report (b:1). |
| December 7, 1987 | Letter from ADEQ to Circuit Express requesting information on hazardous waste determination, generation rates, and accumulation practices (c:1). |
| April 13, 1988 | Letter of warning from ADEQ to Circuit Express listing violations found in October 20, 1987, inspection and again requesting information in December 7, 1987, letter (d:1). |
| April 21, 1988 | Meeting between ADEQ and Circuit Express discussing lab results and possible on-site treatment of 35 to 40 drums of waste that were left on-site by Megatronics. |
| July 13, 1988 | Letter from ADEQ to Circuit Express restating letter of April 13, 1988, which had not been answered. |
| August 12, 1988 | Letter from Circuit Express to ADEQ providing the information requested in ADEQ's July 13, 1988, letter (i:1). |
| September 19, 1988 | Letter from ADEQ to Circuit Express stating that Circuit Express's responses are inadequate and requesting additional information on waste determination. |
| November 8, 1988 | EPA Region IX sends CERCLA Section 104(e) information request letter to B&P (ii:1). |
| November 8, 1988 | EPA Region IX sends CERCLA Section 104(e) information request letter to Circuit Express (hh:1). |
| November 8, 1988 | Letter from B&P to EPA Region IX with pictures of buildings around Circuit Express facility. |
| December 9, 1988 | B&P responds to EPA Region IX's CERCLA Section 104(e) information request letter (f:1). |
| January 1989 | Circuit Express responds to EPA Region IX's CERCLA Section 104(e) information request letter (k:1). |
| January 9, 1989 | Letter from ADEQ to Circuit Express restating the September 19, 1988, letter which had not been answered. |
| January 10, 1989 | B&P provides additional response to EPA Region IX's CERCLA Section 104(e) information request letter (g:1). |
| February 6, 1989 | Meeting between ADEQ and Circuit Express regarding the need for a waste determination. |
| June 7, 1989 | EPA Region IX issues a CERCLA Sections 106(a) and 107(a) general notice letter to B&P (m:1). |
| June 14, 1989 | Letter from Circuit Express to ADEQ providing information requested in ADEQ's January 9, 1989, letter (j:1). |

| <p align="center">Table 1 Regulatory Correspondence, Inspections, and Meetings Circuit Express Facility</p> | |
|--|--|
| July 27, 1989 | Memo from ADEQ to file stating that Circuit Express still has one minor violation that has not been addressed. This recordkeeping violation was referred for review and inclusion into any subsequent letter of warning, following the next ADEQ inspection. (e:1) |
| May 29, 1990 | CH2M Hill conducts interviews of B&P representatives (h:1). |
| July 11, 1990 | CH2M Hill conducts site inspection of Circuit Express facility (o:1). |
| April 3, 1992 | Circuit Express submits facility closure plan to city of Tempe (v:1; w:1). |
| May 1, 1992 | City of Tempe Fire Department provides comments on facility closure plan to Circuit Express (nn:1). |
| May 8, 1992 | City of Tempe Fire and Building Safety Departments inform Circuit Express that chemical storage at facility does not comply with regulatory requirements (oo:1-3). |
| May 21, 1992 | ADEQ conducts inspection of Circuit Express facility (gg:1). |
| July 9, 1992 | ADEQ forwards copy of inspection report to Circuit Express, along with list of concerns to be addressed (gg:1) |
| August 24, 1992 | EPA Region IX sends CERCLA Section 104(e) followup information request letter to Circuit Express (jj:1). |
| October 20 and 26, 1992 | Circuit Express responds to EPA Region IX's CERCLA Section 104(e) followup information request letter (n:1; kk:1). |

In February 1984, ADEQ observed that ECM was disposing of wastewater containing copper and lead to the city sewer system without the required permit (l:1). ECM was issued an interim industrial waste discharge permit, and routine sampling visits were scheduled to monitor ECM's efforts to comply with the discharge standards (aa:1; l:2). ECM consistently discharged wastewater above allowable limits for lead and copper (aa:1; bb:1; l:2,4). In March 1984, ECM went out of business, and sampling at ECM ceased (l:1).

ADEQ inspected the CEX facility on October 20, 1987. At the time of inspection, 10 55-gallon containers, 12 five-gallon containers, and 10 one-gallon containers of waste "acid," and other product containers were stored outside the main building in the chemical storage area. An additional 29 55-gallon drums of "acid" waste were stored on the pavement adjacent to the covered storage area. The containers were not labeled, and five of the drums, including one with unknown contents, were open. CEX personnel indicated that these containers had been left onsite when Megatronics, the former tenant, left the facility in July 1987. Some of the drums were about 10 feet from the on-site drywell. CEX eventually corrected the regulatory violations, except for providing ADEQ with a copy of CEX's hazardous waste determination log. The drummed wastes were treated on-site in March 1989 to reduce the volume of waste.

The treatment was a filtration process that resulted in a solid hazardous waste that was manifested off-site for disposal. (a:1,2,4,6; c:1; d:1-2; e:1; i:1; j:1)

The City of Tempe, Environmental Services Section, conducted inspections at the CEX facility on December 4, 1991, and September 21, 1992. On December 4, 1991, the inspector noted that the hazardous waste storage area was full, and that CEX's samples were not being analyzed by procedures having proper quality assurance and quality control. The September 21, 1992, inspection did not record any significant concerns. (ee:1; ff:1).

The City of Tempe, Water/Wastewater Division, has been conducting routine inspections of the facility every three months (o:11). When Megatronics operated at this site, its process waste stream was consistently above its discharge limits for copper and lead and, at times, for nickel and zinc. A pretreatment system was in place, but was not adequate. CEX also has regularly exceeded its discharge limits for copper and lead concentrations in the wastewater discharge (n:10000008,10000018). CEX has attempted various pretreatment approaches and, as of April 1991, was in compliance, according to Alan Jensen of the city's Water/Wastewater Division (n:10000008,10000018). In a wastewater sample taken on January 5, 1993, total cyanide, cadmium, chromium and nickel were not detected (dd:4,5). Copper was detected at 0.029 mg/l, lead at 0.01 mg/l, and zinc at 0.031 mg/l, all of which are below allowable discharge limits (bb:2; dd:5).

9.0 SUMMARY OF CH2M HILL'S VISUAL SITE INSPECTION

On July 11, 1990, after an interview of Tudor Melville, CH2M Hill conducted an inspection of the CEX facility to examine the facility's processes and former waste disposal areas (o:1).

Within the CEX facility, the various production stages for the making of printed circuit boards were observed, and the processes involved in the manufacture of circuit boards were explained. The area where photo screens are processed and developed was examined, as were the facility's automated drill presses, copper plating line, wave soldering hood, and ammonium etch tanks. Stock supplies of copper and unmasked circuit boards were stored in a raw material storage area.

In the pretreatment system, the aluminum reduction tank and rinsewater pretreatment system are designed to lower the quantity of nickel and copper in rinsewater prior to disposal. At the time of the inspection, the pH monitor for this pretreatment system read pH 7, indicating that the pretreatment system was apparently functioning as intended.

All of the walkways of the production areas where solutions are used within the facility are raised wooden grates. Spills obviously had occurred along the plating lines and at the

ammonium etch tanks, but no floor drains were observed. Facility representatives did not mention how spills in the production areas were handled.

The facility's dry well and outside raw material and waste storage area were observed. The dry well, located to the south of the building, was constructed for control of surface water during high intensity rainstorms. At the time of the inspection, the dry well was plugged with an inverted bucket approximately 12 to 18 inches below grade, beneath the dry well's surface metal grate.

The raw material and waste storage area was surrounded by a concrete berm about eight inches high, and was covered by a tin roof. Approximately a dozen drums were stored outside the storage area containment area, but no evidence of spills was observed.

10.0 ENVIRONMENTAL DATA

Soil Gas Data

Soil gas samples were collected in the vicinity of the CEX facility by the EPA in 1988 and by ADEQ in 1994. Five soil gas samples were collected in 1988. The results from these samples are presented in Table 2. The data have been validated, and quality assurance/quality control data are available. Figure 1 shows the sampling locations.

Three of the soil gas samples (S39, S83, and S84) collected south of the building where the dry well is located contained relatively high concentrations of TCA (58.7 µg/l, 14.70 µg/l, and 33.90 µg/l, respectively). In sample S83, 31.00 µg/l of TCE was detected. A significantly lower concentration of TCE was found in S39 (1.10 µg/l). TCE was not detected in S84. PCE was present in relatively high concentrations in these three samples (84.80 µg/l, 70.90 µg/l, and 21.00 µg/l, respectively). DCE (1,1-dichloroethene) was detected in relatively low concentrations in these samples (3.03 µg/l, 0.88 µg/l, and 3.15 µg/l, respectively).

Sample S38 was collected from the northwest corner of the property. This sample contained very low concentrations of the constituents for which the samples were analyzed. The highest concentration found in this sample was 0.40 µg/l of TCE. Sample S99 was collected from a vacant lot south of the CEX facility. All constituents were detected, with methane (landfill gas) detected at 14.9 µg/l, and the other constituents ranging in concentration from 0.05 µg/l of TCA to 0.49 µg/l of toluene.

| <p align="center">Table 2 Results of the 1988 Soil Gas Sampling at the Circuit Express Facility</p> | | | | | |
|--|-------------------|-------|-------|-------|------|
| Compound | Sampling Location | | | | |
| | S38 | S39 | S83 | S84 | S99 |
| Vinyl Chloride | 0.01U | 0.01U | 0.01U | 0.01U | 0.06 |
| 1,1-Dichloroethene | 0.04 | 3.03 | 0.88 | 3.15 | 0.26 |
| 1,1,1-Trichloroethane | 0.01U | 58.70 | 14.70 | 33.90 | 0.05 |
| Trichloroethene | 0.40 | 1.10 | 31.00 | 0.01U | 0.10 |
| Perchloroethene | 0.01U | 84.80 | 70.90 | 21.00 | 0.13 |
| Benzene | 0.02 | 0.02 | 0.01 | 0.02 | 0.39 |
| Toluene | 0.01U | 0.06 | 0.01 | 0.03 | 0.49 |
| Ethylbenzene | 0.01 | 0.02 | 0.01U | 0.01 | 0.31 |
| Meta- and Para-Xylenes | 0.11 | 0.06 | 0.01U | 0.02 | 0.42 |
| Ortho Xylenes | 0.01U | 0.08 | 0.01 | 0.01 | 0.34 |
| Methane | 0.01U | 0.01U | 0.01U | 0.01U | 14.9 |
| <p>Note: U = Compound was not detected above the concentration listed.</p> | | | | | |

In 1994, ADEQ collected 26 soil gas samples at the facility. Tetrachloroethene was the only compound detected and was detected in 15 of the samples. Tetrachloroethene was detected in the samples located near the southern half of the property building near the chemical storage area and the dry well, and south of the southern property boundary. The maximum concentration of tetrachloroethene detected in the subsurface was 24 µg/l in Sample H-16, north of the chemical storage area. The analytical results and the sampling locations are presented in Table 3 and Figure 1A, respectively. These data have been validated, and quality assurance/quality control data are available.

Soil Data

On January 23, 1992, a consultant for CEX took soil samples from three locations under the concrete floor of the facility. The sample locations were the plating area, the wastewater treatment area, and an area between these locations. Three samples were taken at each location at depths of zero to six inches, 1 to 1.5 feet, and 3 to 3.5 feet. In addition, a background sample was taken from a lot south of the facility at a depth of zero to six inches. Each sample was analyzed for total copper, nickel, zinc and lead, and for lead using the toxicity characteristic leaching procedure (TCLP). The highest concentrations in the facility samples (background sample concentration in parentheses) were copper at 24 ppm (50 ppm), nickel at 36 ppm (21 ppm), zinc at 53 ppm (44 ppm), and lead at 41 ppm (28 ppm). The consultant

Table 3
Analytical Results from ADEQ Soil Gas Sampling
Sampling Dates 6/2/94, 6/3/94, 7/7/94 and 7/8/94
Circuit Express
(µg/l)

| Compound | H-1 | H-2 | H-3 | H-4 | H-5 | H-6 | H-7 | H-8 | H-9 | H-10 | H-12 | H-13 | H-14 | H-15 | H-16 | H-17 | H-18 | H-19 | H-20 | H-21 | H-26 |
|-------------------------|-----|-----|-----|-----|-----|-----|-------------|--------|-------|------|------|------|------|------|-------------|------|------|------|------|------|------|
| Vinyl Chloride | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U |
| Dichloroethene | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U |
| Methylene Chloride | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U |
| Chloroform | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U |
| Trichloroethane | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U |
| Trichloroethene | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U |
| Tetrachloroethene | 1U | 1U | 1U | 1U | 3 | 5.5 | 22 E / 21 D | 7.8 JL | 14 JL | 1U | 14 | 17 | 16 | 8 | 24 E / 22 D | 1U | 9.2 | 8.8 | 10 | 8.7 | 9.4 |
| Benzene | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U |
| Ethylbenzene | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U |
| Meta- and Para-xylenes | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U |
| Ortho-xylenes | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U |
| Dichlorodifluoromethane | 2U | 2U | 2U | 2U | 2U | 2U | 2U | 2U | 2U | 2U | 2U | 1U | 1U | 1U | 1U | 2U | 2U | 1U | 1U | 1U | 1U |
| Trichlorofluoromethane | 5U | 5U | 5U | 5U | 5U | 5U | 5U | 5U | 5U | 5U | 5U | 1U | 1U | 1U | 1U | 5U | 5U | 1U | 1U | 1U | 1U |
| Toluene | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U |
| Bromoform | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U | 1U |

Notes:

D = The analyte is quantitated from a secondary dilution of the sample or sample extract.

E = The calculated concentration for an analyte exceeded the linear calibration range, possibly producing an artificially low result.

JL = Estimated Value. The analyte in the laboratory control sample exceeded the percent recovery 70% -

U = The analysis was performed, but analyte was not detected above the associated concentration.

The associated numerical value is the method quantitation limit adjusted for sample and analytical conditions.

EAST FIFTH STREET

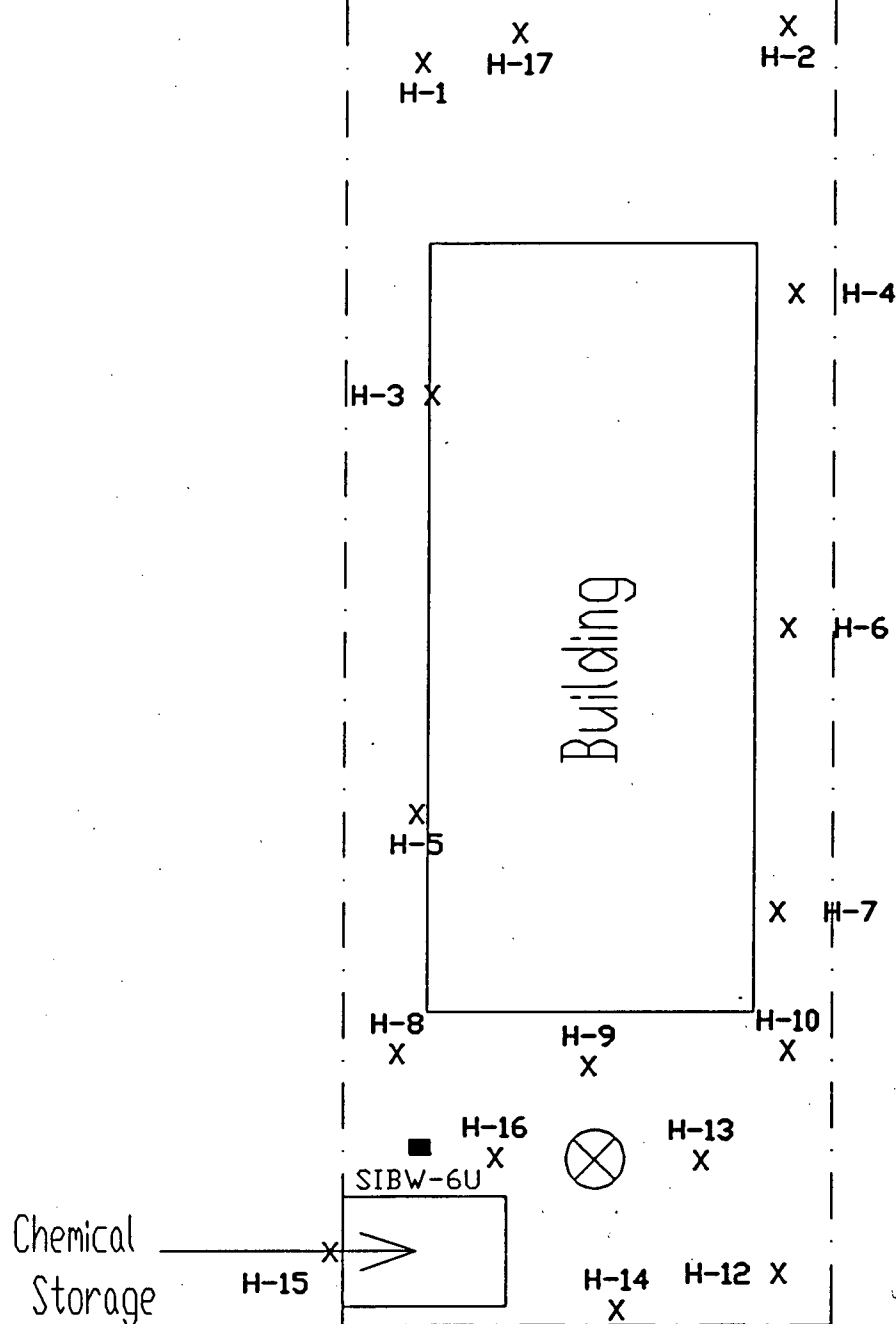
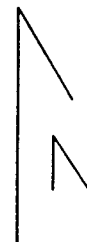


FIGURE 1A

Site Map, Proposed Soil Gas Sample Locations

CIRCUIT EXPRESS

South Indian Bend Wash Study Area

2149 E. Fifth Street Tempe, AZ

concluded that these concentrations were "not significantly higher" than the background sample. (z:1-7)

Groundwater Data

Results of April 1991 water quality analysis for volatile organic compounds (VOCs) for samples collected by EPA from groundwater monitoring well no. SIBW-6U, located in the rear of the CEX facility, showed 1,1-dichloroethane at 0.30 µg/l; 1,2-dichloroethene (total) at 1 µg/l; and PCE at 3 µg/l PCE. These concentrations are below the federal Safe Drinking Water Act Maximum Contaminant Levels (MCLs) allowable for drinking water. (n:10000037)

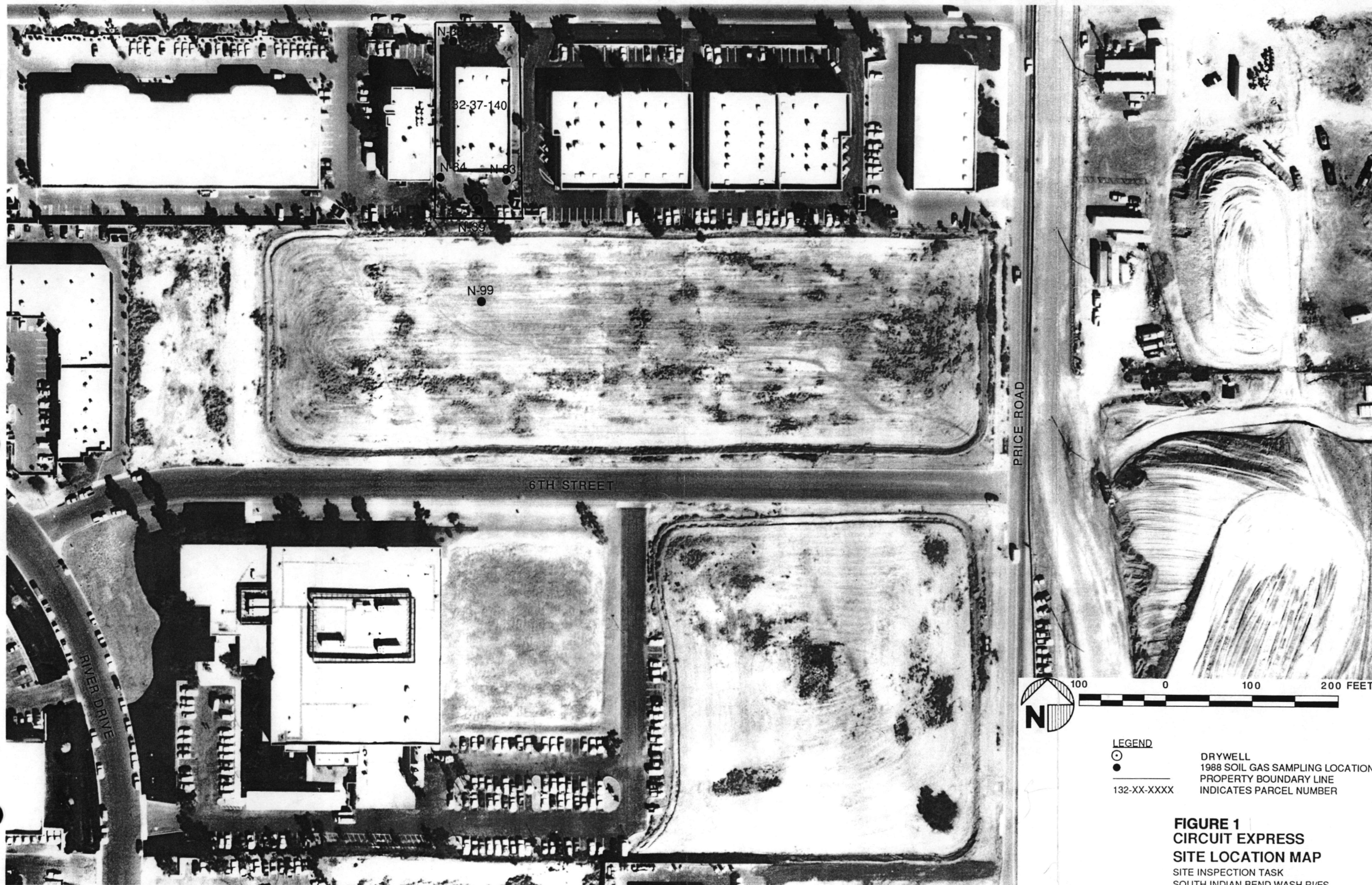


FIGURE 1
CIRCUIT EXPRESS
SITE LOCATION MAP
 SITE INSPECTION TASK
 SOUTH INDIAN BEND WASH RI/FS

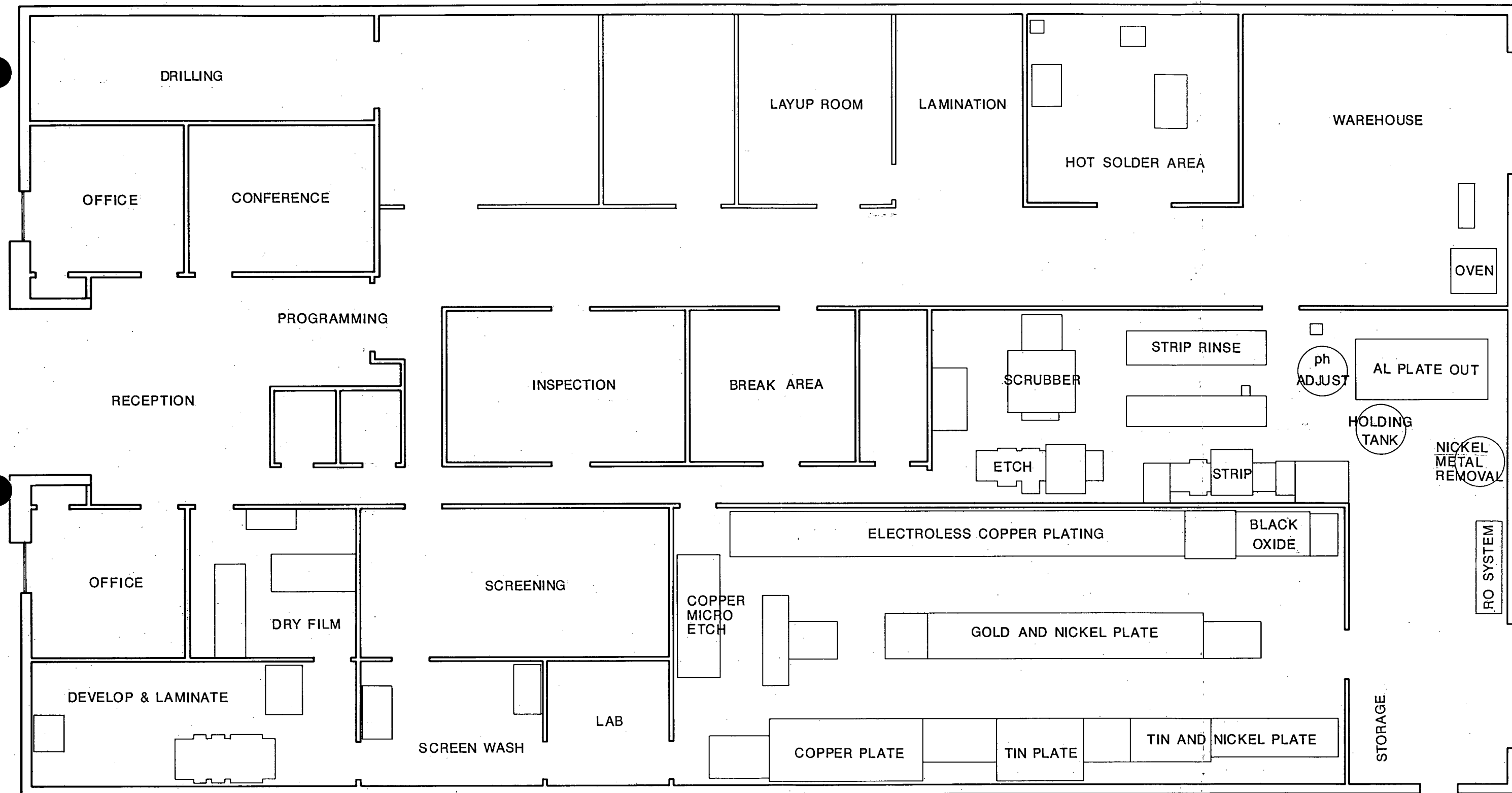


FIGURE 2
CIRCUIT EXPRESS
FACILITY LAYOUT
 SITE INSPECTION TASK
 SOUTH INDIAN BEND WASH RI/FS

APPENDIX A
REFERENCES

APPENDIX A

REFERENCES CITED IN THE CIRCUIT EXPRESS, INC. PRELIMINARY PROPERTY INVESTIGATION REPORT

- a. Arizona Department of Environmental Quality. Hazardous Waste Inspection Report on Circuit Express, dated October 20, 1987.
- b. Arizona Department of Environmental Quality. Letter from Dale A. Anderson to Errol Melville of Circuit Express, forwarding a copy of the October 20, 1987, inspection report, dated October 27, 1987.
- c. Arizona Department of Environmental Quality. Letter from David Regonini to Errol Melville of Circuit Express, requesting information supplementing October 20, 1987, inspection, dated December 7, 1987.
- d. Arizona Department of Environmental Quality. Letter from David Regonini to Errol Melville of Circuit Express, listing violations observed during the October 20, 1987, inspection, dated April 13, 1988.
- e. Arizona Department of Environmental Quality. Memorandum from Chuck Helms to Circuit Express Facility File, regarding receipt of compliance status report and one remaining minor violation, dated July 27, 1989.
- f. B&P International Land, Title and Investments. Response to United States Environmental Protection Agency, Region IX, CERCLA Section 104(e) information request letter of November 8, 1988. Response dated December 9, 1988, and signed by Beverly Fischgrund and Patricia Massman. Superfund Records Center File Number (SRCFN) 3918-91284.
- g. B&P International Land, Title and Investments. Supplemental Response to United States Environmental Protection Agency, Region IX, CERCLA Section 104(e) information request letter of November 8, 1988. Response dated January 10, 1989, and signed by Beverly Fischgrund and Patricia Massman.
- h. CH2M Hill. Hazardous Waste Inspection Report on Interview of B&P International Land, Title and Investments, dated May 29, 1990.

- i. Circuit Express. Letter from Errol Melville to Mr. Miller of Arizona Department of Environmental Quality, responding to alleged regulatory violations, dated August 12, 1988.
- j. Circuit Express. Letter from Errol Melville to Chuck Helms of Arizona Department of Environmental Quality, responding to alleged regulatory violations, dated June 14, 1989.
- k. Circuit Express. Response to United States Environmental Protection Agency, Region IX, CERCLA Section 104(e) information request letter of November 8, 1988. Undated response signed by Errol W. Melville, SRCFN 3918-00453.
- l. City of Tempe. Letter from John D. Mann to Norm Gumenik of Arizona Department of Health Services, regarding discharge by Electronic Circuitry Mfg. Co. into dry well, dated March 16, 1984.
- m. United States Environmental Protection Agency, Region IX. CERCLA Sections 106(a) and 107(a) general notice letter from Jerry Clifford to Beverly Fischgrund of B&P International Land, Title and Investments, dated June 7, 1989. SRCFN 3918-00518.
- n. Circuit Express. Response to United States Environmental Protection Agency, Region IX, CERCLA Section 104(e) information request letter of August 24, 1992. Response dated October 20, 1992, and signed by Alfred W. Ricciardi of Robbins & Green, attorneys for Circuit Express, Inc. SRCFN 3918-01695, 3918-01696, 3918-01697, 3918-01698, 3918-01699.
- o. CH2M Hill. Hazardous Waste Inspection Report on Circuit Express, Inc., dated July 11, 1990.
- p. Prentice Hall "Online" database report for Circuit Express, Inc. Data valid through July 22, 1992. Also included is Dataquick database report on parcel nos. 132-37-140, 132-37-045A, and 132-37-046. Reports obtained on December 16, 1992.
- q. Arizona Corporation Commission, Incorporation Division. Articles of Incorporation of Circuit Express, Inc., filed October 15, 1987.
- r. Dun and Bradstreet Business Information Report for Circuit Express, Inc., printed on January 4, 1993. Operations statement dated December 7, 1992. SRCFN 3918-01535.
- s. Dun and Bradstreet Business Information Report for Circuit Express, Inc., printed on June 29, 1990. Operations statement dated December 15, 1989. SRCFN 3918-01376.

- t. Megatronics, Inc. City of Tempe, Department of Building Safety, Application for Change in Occupancy or Use of Building, dated June 4, 1984.
- u. City of Tempe, Department of Building Safety. List of permits for 2149 East 5th Street, Tempe, Arizona, dated from February 29, 1980 to May 16, 1988.
- v. Circuit Express. Letter from Jackson H. Roberts to Dave Scott of the City of Tempe Department of Building Safety, and Mark Scott of the City of Tempe, Fire Department, regarding relocation of Circuit Express operations, dated April 3, 1992.
- w. Scott, Allard & Bohannon, Inc. Facility Closure Plan, Revision No. 1, for Circuit Express, Inc., dated May 18, 1992.
- x. Circuit Express. City of Tempe, Environmental Services Section, Total Toxic Organic Response Form, dated December 30, 1992.
- y. Megatronics, Inc. Letter from Tudor Melville to Alan Jensen of City of Tempe, regarding copper content in wastewater discharge, dated August 16, 1985.
- z. Scott, Allard & Bohannon, Inc. Letter from Thor Anderson to Tudor Melville of Circuit Express, forwarding report on soil sampling at Circuit Express, Inc., dated February 10, 1992.
- aa. City of Tempe, Water/Wastewater Division. Interim Industrial Waste Discharge Permit for Electronic Circuitry Manufacturing, dated February 8, 1984.
- bb. City of Tempe. Interoffice memorandum from Bill Coughlin and Pete Lenstrohm to John Mann, regarding discharge limit exceedances by Electronic Circuitry Manufacturing Co., dated February 2, 1984.
- cc. Circuit Express. Portions of City of Tempe Wastewater Discharge Permit Questionnaire, due date June 30, 1992.
- dd. Analytical Technologies, Inc. Letter from Jane M. Foote to Al Jensen of the City of Tempe Environmental Services Section, regarding results of analysis of aqueous samples, dated January 13, 1993.
- ee. City of Tempe, Environmental Services Section. Memorandum from Eric W. Staedicke to Environmental Services File, regarding inspection of Circuit Express on December 4, 1991, dated December 19, 1991.

- ff. City of Tempe, Environmental Services Section. Memorandum from Eric W. Staedicke to Environmental Services File, regarding inspection of Circuit Express on September 21, 1992, dated November 6, 1992.
- gg. Arizona Department of Environmental Quality. Letter from Dale A. Anderson to Jackson Roberts, regarding the May 21, 1992, inspection of Circuit Express, dated July 9, 1992.
- hh. United States Environmental Protection Agency, Region IX. CERCLA Section 104(e) information request letter from Jeff Zelikson to Errol Melville of Circuit Express, dated November 8, 1988. SRCFN 3918-00451.
- ii. United States Environmental Protection Agency, Region IX. CERCLA Section 104(e) information request letter from Jeff Zelikson to Beverly Fischgrund of B&P International Land, Title and Investments, dated November 8, 1988. SRCFN 3918-00449.
- jj. United States Environmental Protection Agency, Region IX. CERCLA Section 104(e) information request letter from Keith Takata to Digby Melville of Circuit Express, dated November August 24, 1992. SRCFN 3918-01736.
- kk. Circuit Express. Supplemental response to United States Environmental Protection Agency, Region IX, CERCLA Section 104(e) information request letter of August 24, 1992. Response dated October 26, 1992, and signed by Alfred W. Ricciardi of Robbins & Green, attorneys for Circuit Express, Inc. SRCFN 3918-01767.
- ll. Megatronics, Inc. City of Tempe Hazardous Materials Information form, dated June 5, 1984.
- mm. Circuit Express. List of process tanks and summary of hazardous materials from Jackson H. Roberts to City of Tempe, Environmental Services Section, dated September 14, 1992.
- nn. City of Tempe, Fire Department. Letter from Russ Wollam to Jackson H. Roberts of Circuit Express, regarding facility closure plan, dated May 1, 1992.
- oo. City of Tempe, Fire and Building Safety Departments. Letter from Marc T. Scott and David Scott to Jackson H. Roberts of Circuit Express, regarding chemical storage at facility, dated May 8, 1992.

APPENDIX B

**TITLE TREE FOR
MARICOPA COUNTY TAX ASSESSOR'S PARCEL NO. 132-37-140
FROM THE
SIBW FINAL TITLE SEARCH REPORT, PREPARED BY
PRC ENVIRONMENTAL MANAGEMENT, INC.,
DATED FEBRUARY 7, 1992**

**TITLE TREE FOR
PARCEL 132-37-140**

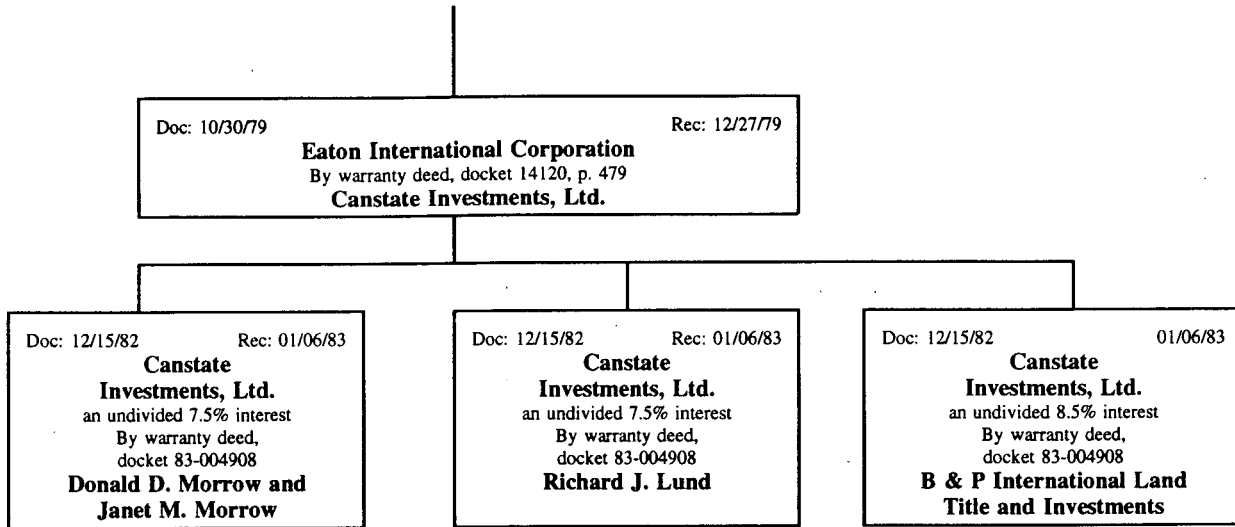
Doc: 04/28/59 Rec: 04/29/59
Emma M. Birchett
By deed and disclaimer, docket 2844, p. 408
Myrna M. Birchett

Doc: 07/25/73 Rec: 08/14/73
**Robert W. Birchett, Myrna M. Birchett,
George H. Birchett, Sarah E. Birchett,
and Emma M. Birchett**
By warranty deed, docket 10267, p. 443
Eaton International Corporation

Doc: 08/14/73 Rec: 08/14/73
**Eaton International
Corporation**
Deed of trust and assignment of rents,
docket 10267, p. 447
**Transamerica Title Insurance
Company, Trustee**
Beneficiaries are:
Robert W. Birchett, Myrna M.
Birchett, George H. Birchett,
Sarah E. Birchett, and Emma M.
Birchett

Doc: 06/12/75 Rec: 07/08/75
Transamerica Title Company
By special warranty deed,
docket 11234, p. 312
**Transamerica Title Insurance
Company**

Doc: 07/16/79 Rec: 08/09/79
**Transamerica Title Insurance
Company**
By special warranty deed,
docket 13820, p. 1147
**Eaton International
Corporation**



APPENDIX C

**OUTLINE OF CIRCUIT EXPRESS, INC.'S MANUFACTURING PROCESS
SOURCE: SRCFN 3918-01696, PAGES 11-12**

Mr. Jeffrey A. Dhont
October 20, 1992
Page 11

MANUFACTURING PROCESS

1. Program computer controlled drills for drilling.
2. Drill first article and inspect.
3. Artwork laid up to the drilled first article and inspected.
4. Shear copper clad laminate to the required panel size.
5. Clean the inner layers by running through a mechanical scrubber.
6. Coat the inner layers with a photo-sensitive dry film.
7. Expose the dry film through the appropriate artwork.
8. Develop the dry film on the inner layers.
9. Etch off the exposed copper.
10. Strip off the dry film.
11. Run inner layers through the oxide process which coats the exposed copper with copper oxide.
12. Laminate the inner layers together to form the multi-layer panel.
13. Drill the holes in the panel.
14. Run the panels through the desmear line to remove any resin smear inside the holes.
15. Run the panels through the electroless copper line to deposit copper on the substrate inside the hole.
16. Coat the panels with photosensitive dry film.

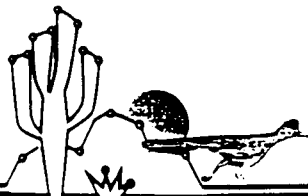
Mr. Jeffrey A. Dhont
October 20, 1992
Page 12

17. Expose the dry film through the appropriate artwork.
18. Develop the dry film.
19. Run the panels through the pattern clear line.
20. Electroplate copper on panels.
21. Electroplate tin over the copper. This tin is the etch resist.
22. Strip off the dry film.
23. Etch off the exposed copper.
24. Strip off the tin.
25. Inspect the etched panel.
26. Scrub panel.
27. Screen on soldermask and cure in the oven.
28. Gold plate connector fingers.
29. Solder coat panels.
30. Screen on legend and cure in the oven.
31. Route out individual circuit boards from the panel.
32. Run boards through final clean machine.
33. Final inspect.
34. Test boards for shorts and opens.

APPENDIX D

**LIST OF PROCESS TANKS AND SUMMARY OF HAZARDOUS MATERIALS
AT CIRCUIT EXPRESS, INC., AS OF SEPTEMBER 14, 1992**

SOURCE: FILES OF CITY OF TEMPE, ENVIRONMENTAL SERVICES SECTION



(602) 966-5894
(602) 966-5896 FAX

CIRCUIT EXPRESS, INC.

2149 E. 5th St., Tempe, AZ 85281

DESMEAR/ELECTROLESS LINE

| TANK LOC. | CHEMICAL DESCRIPTION | QTY GAL | PH | CONTENTS, MSDS TITLE |
|--------------|-------------------------|------------|------|--|
| E-1 | SWELLER | 34 | 12 | 10% sodium hydroxide, 40% XD6137-T |
| E-2 | DESMEAR | 39 | 12.5 | 60gle, 19275, 5% sodium Hydroxide |
| E-3 | NEUTRALIZER | 38 | 0 | 7% sulfuric acid, 10% 19279 |
| E-4 | CONDITIONER | 46 | 9.5 | 10% conditioner 90 |
| E-5 | MICROETCH | 48 | 0 | 8.5% sulfuric acid 7% cobra etch make up 4% cobra etch |
| E-6 | PREDIP | 40 | 2.0 | 26 oz/gal 93P |
| E-7 | ACTIVATOR | 40 | 0.2 | 26 oz/gal 93P, 0.9% 95A |
| E-8 | ACCELERATOR | 40 | 9 | 1.3oz/gal 97A 1.0 % 97B |
| E-9 | ELECTROLESS CU | 45 | 12 | 4.0% 85A, 10%85B 3% 85D 0.2% 85G, 0.5% FORMALDEHYDE |
| E-10 | ACID DIP | 40 | 0 | 5% sulfuric acid |
| E-11 | ANTITARNISH | 40 | 2 | 0.25% oxyban 60 |

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D-1



CIRCUIT EXPRESS, INC.

(602) 966-5894
(602) 966-5896 FAX

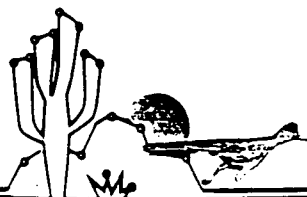
2149 E. 5th St., Tempe, AZ 85281

PATTERN PLATING LINE

| TANK LOC. | CHEMICAL DESCRIPTION | QTY GAL | PH | CONTENTS, MSDS TITLE |
|--------------|-------------------------|------------|-----|---|
| P-1 | ACID CLEANER | 92 | 0.5 | 10% 717 cleaner |
| P-2 | MICROTECH | 52 | 0 | 8.5% sulfuric acid, 7.0% cobra etch make-up, 1.0% cobra etch |
| P-3 | ACID HOLD | 22.5 | 0 | 10% sulfuric acid |
| P-4 | ACID COPPER | 800 | 0 | 10.5% sulfuric acid 0.5% PC667, 9.5 oz/gal Cupric Sulfate |
| P-5 | ACID HOLD | 40 | 0 | 10% sulfuric acid |
| P-6 | ACID TIN | 315 | 0 | 10% sulfuric acid 4% tin brite make-up 0.4% tinbrite re- plenisher, 4.0 oz/gal stannous sulfate |
| P-7 | ACID HOLD | 70 | 0 | 5% hydrochloric acid |
| P-8 | TIN NICKEL | 195 | 4 | 33 oz/gal nickel chloride 6.7 oz/gal stannous chloride 20% tin nickel starter |
| P-9 | RACK STRIP | 26 | 0 | 50% metex 4075, 25% nitric acid |

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D-2



CIRCUIT EXPRESS, INC.

(602) 966-5894
(602) 966-5896 FAX

2149 E. 5th St., Tempe, AZ 85281

STRIP AND ETCH

| TANK LOC. | CHEMICAL DESCRIPTION | QTY GAL | PH | CONTENTS, MSDS TITLE |
|--------------|-------------------------|------------|----|----------------------|
| S-1 | DRY FILM STRIP | 33 | 12 | 10% ADF-12 BAT |
| S-2 | ALKALINE ETCH | 80 | 0 | Ultra Etch 50 |
| S-3 | TIN STRIP | 55 | 0 | TS-12 |

BLACK OXIDE

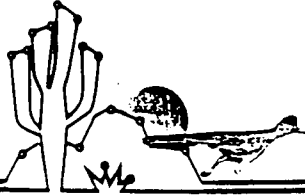
| | | | | |
|-----|-------------|----|----|-------------------------------------|
| B-1 | PRE DIP | 40 | 12 | 35 g/l 19249 |
| B-2 | BLACK OXIDE | 40 | 12 | 35 g/l 19249, 180 g/l omnibond F |

NICKEL/GOLD LINE

| | | | | |
|-----|----------------|----|------|---|
| G-1 | TIN/LEAD STRIP | 1 | 4 | 100% select strip plus |
| G-2 | ALKALINE CLEAN | 35 | 13.5 | 15% E-250 |
| G-3 | MICROETCH | 35 | 0 | 8.5% sulfuric acid, 7% cobra etch make up 4% cobra etch |
| G-4 | ACTIVATOR | 35 | 0 | 10% sulfuric acid |
| G-5 | NICKEL | 52 | 3.8 | 10.25 oz/gal nickel sulfamate, 0.8 oz/gal nickel chloride |
| G-6 | ACTIVATOR | 35 | 0.8 | 20 oz/gal metex M-6294 |
| G-7 | GOLD | 38 | 4.5 | 0.75 troy oz/gal Auruna 6700 |

9/14/92 JAR

D-3



(602) 966-5894
(602) 966-5896 FAX

CIRCUIT EXPRESS, INC.

2149 E. 5th St., Tempe, AZ 85281

HOT AIR LEVELING

| TANK LOC. | CHEMICAL DESCRIPTION | QTY GAL | PH | CONTENTS, MSDS TITLE |
|--------------|-------------------------|------------|------|----------------------|
| | FLUX | 5 | 1 | #677-MG Higrade |
| | TAPE RESIDUE | | | |
| | REMOVER | 10 | - | Bio Act EC-1 |
| | TIN/LEAD SOLDER 400 lb | | - | 63% Tin, 37% Lead |
| ----- | | | | |
| SCREEN ROOM | | | | |
| | INK REMOVER | 55 | - | BLO |
| ----- | | | | |
| PHOTO | | | | |
| | DEVELOPER | 35 | 10.5 | 2% ADC 40 |

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CIRCUIT EXPRESS, INC.
SUMMARY OF HAZARDOUS MATERIALS
229 S. CLARK DRIVE
TEMPE, AZ 85281

| | LIST HAZARDOUS MATERIALS | AMT. IN USE | AMT. IN STORAGE | FAHRENHEIT FLASH |
|----|---|-------------------|-----------------|---------------------|
| C | SULFURIC ACID | 164 GAL | 85 GAL | N/A |
| C | HYDROCHLORIC ACID | 3 GAL | 15 GAL | N/A |
| C | *ALKALINE ETCH | *85 GAL | 220 GAL | N/A |
| | FORMALDEHYDE | 2 GAL | 10 GAL | N/A |
| C | TS12 TIN STRIP | 55 GAL | 0 | N/A |
| F | ISOPROPYL ALCOHOL | 1 PINT | 1 QT | 53°F (TCC) |
| T | POTASSIUM CYANIDE AU | 1295 GRAMS | 0 | N/A |
| C | CAUSTIC SODA (25%) | 65 GAL | 55 GAL | N/A |
| C | ADF-12 BAT DF STRIP | 4 GAL | 51 GAL | 190°F (PMCC) |
| C | NITRIC ACID | 8 GAL | 7 GAL | N/A |
| FS | SODIUM HYDROSULFITE | 1 LB | 100 LB | N/A |
| C | *AQUA AMMONIA | *55 GAL | 0 | N/A |
| C | NICKEL CHLORIDE | 400 LBS | 5 GAL | N/A |
| C | METEX E-250 (40% KOH) | 5 GAL | 0 | N/A |
| C | SELECT STRIP PLUS | 1 GAL | 4 GAL | N/A |
| O | COBRA ETCH (H ₂ O ₂) | 4 GAL | 5 GAL | N/A |
| C | 717 ACID CLEANER | 10 GAL | 10 GAL | N/A |
| O | MACDERMID 9275 | 16 LBS | 50 LBS | N/A |
| O | MACDERMID (OMNIBOND-F) | 5 GAL | 15 GAL | N/A |
| C | MACDERMID 85A | 2 GAL | 55 GAL | N/A |
| C | MACDERMID 85B | 5 GAL | 15 GAL | N/A |
| C | MACDERMID 85C | 2 GAL | 55 GAL | N/A |
| C | MACDERMID 95A | .3 GAL | .7 GAL | N/A |
| - | STANNOUS SULFATE | 79 LBS | 5 GAL | N/A |
| C | METEX M-629U | 50 LBS | 50 LBS | N/A |
| C | SODIUM BOROHYDRIDE | 0 | 5 GAL | N/A |
| C | METEX 4075 | 15 GAL | 15 GAL | N/A |
| F | ACETYLENE | 6 FT ³ | 0 | -18°C (CC) |
| C | TIN NI STARTER | 39 GAL | 5 GAL | N/A |
| - | TIN NI REPLENISHER | 1 GAL | 1 GAL | N/A |
| C | STANNOUS CHLORIDE | 82 LBS | 100 LBS | N/A |

FS = FLAMABLE SOLID
C = CORROSIVE
F = FLAMMABLE
T = TOXIC
O = OXYDIZERS
* = CLOSED SYSTEM

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